IN-CONVERSATION SEARCH

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation application of and claims priority to U.S. application Ser. No. 14/684,744, filed on Apr. 13, 2015, which is a continuation of and claims priority to U.S. application Ser. No. 12/398,297, filed Mar. 5, 2009, the entire contents of each are hereby incorporated by reference.

TECHNICAL FIELD

This document relates to user interfaces for obtaining search results, such as search results delivered in the middle of a text or voice conversation between two users of a computing system.

BACKGROUND

More and more, people use computers to communicate. Electronic mail permits communication in an asynchronous manner, meaning that two parties need not be present at the same time to communicate. Other communication is synchronous, such as telephone calls made using VOIP technology, text messaging, and chat applications. Generally, this synchronous communication occurs as a voice or text conversation between or among two or more people. During such conversations, any of a number of topics may be discussed. For example, friends may discuss the latest sporting events or may plan social events, while business colleagues may discuss the performance of companies or news in their particular industry.

SUMMARY

This document describes systems and techniques that may be used to provide search results to participants in an electronic conversation. For example, two people may be conversing over a telephone call, such as a call carried over a VOIP connection, and may reach a point where they would like to obtain information that might be available via the internet. One of the users may speak a reserved keyword to trigger a search application, and then may speak one or more search terms. The keyword may cause a component that is following the call, such as a module running on a client device used by one of the call participants, to submit the search terms to a search engine and to return results received from the search engine over the voice connection of the telephone call. In a similar manner, a person participating in an on-line chat session may provide an entry that includes a triggering keyword and one or more search terms. A search result may then be returned into the chat session in a manner that it can be seen by the submitting user or all of the users.

For example, during a discussion between friends, a dispute may arise over which Chicago Bears players entered the Professional Football Hall of Fame during its inaugural year in 1963. One of the participants may state: "query [pause] Pro Football Hall of Fame Class of 1963 From Chicago," where "query" is a reserved term that is used to indicate the intent to have a search performed. The participants may then hear read, over the telephone connection, "Red Grange, George Halas, Bronko Nagurski," if the receiving search engine were able to generate such a precise response to the search request. The system may also preface the search results with other information to indicate that the system properly understood the query, such as starting with the phrase "Chicago Bears Players from the 1963 Hall of Fame Induction Class." The participants may then continue with their discussion, thus avoiding embarrassment to any participant who had maintained that Bronko Nagurski was not an inaugural member of the Hall of Fame. Follow-up options may also be provided to the users, such as a list of multiple possible queries where the query provided by a user was ambiguous to the system, or information from various sources. For example, a user may choose, after obtaining search results, to have an encyclopedic entry of information on the same topic read to them.

In a like manner, business associates may be discussing potential investments in a chat room, so that one participant may wonder the price of stock for a chip maker, and may type "query: cypress." Such a request may be ambiguous to a system in that it could represent Cypress Semiconductor or Cypress Bioscience. As a result, the system could respond, in line with the chat conversation, "enter CY for Cypress Semiconductor; enter CYPB for Cypress Bioscience." Upon the user typing CY, the system may respond, in line with the chat, "Cypress Semiconductor, current 157.50, open 155.25, high 160.25, low, 155.25, change+2.25." Such user reaction may also be used to help disambiguate later searches, such as by determining that later searches are likely to involve requests for stock market information, or information about electronics topics rather than biotechnology-related topics.

Also, the literal results of a prior search may be used to disambiguate subsequent searches. For example, in the Chicago Bears example above, a user may voice the follow-up query "Bronko Nagurski birthdate." Ordinarily, the system might have trouble interpreting the verbal statement "Bronko Nagurski," but the immediate preceding presence of the term in the search results may be used to tilt the system's voice recognition in the direction of the term, and to thus improve the voice recognition of the system.

Provisions may also be provided to permit participants in conversations to control the security of such conversations. For example, the monitoring described here may be performed by a client-side process so that only search terms (and not the main part of a private conversation) are sent to a remote service. Also, remote systems may monitor a conversation passively so that no part of the conversation—aside from the intended search queries—is shared. For example, monitoring may be in a streaming mode, where no information from the normal conversation is stored for more than the short time needed to identify a reserved term in the conversation. Also, sound from a conversation may be hashed on a client device before being sent to a remote server, so that the remote server can only determine whether part of the sound matches a predetermined reserved term, but cannot otherwise determine the content of any other information in the confirmation, until the system senses a reserved word and changes into an active mode to receive search terms. In addition, when a system moves from a passive monitoring mode into a mode in which it is collecting input for submission as a search query, it may explicitly announce itself to the human participants in a conversation, and give the participants a chance to opt out of, or disable, the monitoring functionality.

Certain follow-up activities may also occur from a search result in addition to refining a search and being taken to a landing page for a search result. As one example, participants in a conversation may be conferenced into a communication with a subject of a search result. For example, two participants to a telephone call may be discussing where to have dinner, and one of them may voice the command